

What is claimed is:

1. A radiation sensitive composition, comprising a resin binder, an acid generator compound, and a complexing polar compound.

2. The composition of claim 1 where the polar compound comprises one or more moieties selected from the group consisting of ethers, esters, amides and amines.

3. The composition of claim 1 where the polar compound is an amine.

4. The composition of claim 1 comprising a phenol-based polymer, an amine-based crosslinking agent, and a complexing amine.

5. The composition of claim 1 where the polar compound has a  $pK_a$  of about 8.0 or less.

6. The composition of claim 1 where the polar compound has a  $pK_a$  of about 4.0 or less.

7. The composition of claim 1 where the polar compound has a  $pK_a$  of about 3.2 or less.

8. The composition of claim 1 where the resin binder is a phenol-based polymer.

9. The composition of claim 1 where the resin binder is selected from the group consisting of (1) novolak resins, (2) poly(vinylphenol) resins, (3) phenol-based polymers comprising phenolic units and cyclic alcohol units, (4) polyglutarimides, (5) silylated phenol-based polymers, and (6) polymers made from polystyrene maleimides with pendant acid labile functionalities.

10. A method for treating a photoacid-generating composition, comprising adding a complexing polar compound to the composition.

11. The method of claim 10 where the polar compound is an amine.

12. The method of claim 10 where the polar compound has a  $pK_a$  of about 8.0 or less.

13. The method of claim 10 where the polar compound has a  $pK_a$  of about 4.0 or less.

14. The method of claim 10 where the polar compound has a  $pK_a$  of about 3.2 or less.

15. The method of claim 10 further comprising applying a layer of the composition to a substrate; exposing the composition layer to activating radiation; and heating the composition layer to a temperature sufficient to provide an activating amount of acid.

16. The method of claim 15 where said exposing generates a latent image in the composition layer comprising acid moieties complexed with the polar compound.

17. The method of claim 10 where the composition comprises hexamethoxymethyl melamine, condensation products of hexamethoxymethyl melamine, and hydrolyzed derivatives of hexamethoxymethyl melamine, said hydrolyzed derivatives containing one or more amine groups.

18. A method for enhancing resolution of a photoacid-generating composition, comprising adding a polar compound to the composition, the polar compound having a  $pK_a$  of about 8.0 or less.

19. The method of claim 18 where the polar compound is a complexing polar compound.

20. The method of claim 18 where the polar compound is an amine.

21. The method of claim 18 where the polar compound has a  $pK_a$  of about 4.0 or less.

22. The method of claim 18 where the polar compound has a  $pK_a$  of about 3.2 or less.

23. The method of claim 18 further comprising applying a layer of the composition to a substrate; exposing the composition layer to activating radiation; and heating the composition layer to a temperature sufficient to provide an activating amount of acid.

24. The method of claim 23 where said exposing generates a latent image in the composition layer comprising acid moieties complexed with the polar compound.

25. The method of claim 18 where the composition comprises hexamethoxymethyl melamine, condensation products of hexamethoxymethyl melamine, and hydrolyzed derivatives of hexamethoxymethyl melamine, said hydrolyzed derivatives containing one or more amine groups.

26. A method for controlling acid diffusion of a photoacid-generating composition, comprising:

(a) adding a polar compound to the composition and applying a layer of the composition to a substrate;

(b) exposing the composition layer to activating radiation whereby a latent image is generated comprising acid moieties complexed with the polar compound; and

(c) treating the exposed composition layer to provide an activating amount of acid.

27. The method of claim 26 where the exposed composition layer is treated by heating to a temperature sufficient to provide an activating amount of acid.

28. The method of claim 27 where the composition is heated to a temperature of about 50°C or greater.

29. The method of claim 27 where the composition is heated to a temperature of about 100°C or greater.

30. The method of claim 27 where the composition is heated to a temperature of about 110°C or greater.

31. The method of claim 26 further comprising, prior to the exposing step, baking the composition layer to remove solvent while an effective amount of the polar compound remains disposed in the resist layer.

32. The method of claim 31 where the composition is baked at a temperature of about 90°C or less.

33. The method of claim 26 where the polar compound comprises one or more moieties selected from the group consisting of ethers, esters, amides and amines.

34. The method of claim 26 where the polar compound is a complexing polar compound.

35. The method of claim 26 where the polar compound has a  $pK_a$  of about 8.0 or less.

36. The method of claim 26 where the polar compound has a  $pK_a$  of about 4.0 or less.

37. The method of claim 26 where the photoacid-generating composition comprises a radiation sensitive component and a resin binder selected from the group consisting of (1) novolak resins, (2) poly(vinylphenol) resins, (3) phenol-based polymers comprising phenolic units and cyclic alcohol units, (4) polyglutarimides, (5) silylated phenol-based polymers, and (6) polymers made from polystyrene maleimides with pendant acid labile functionalities.

38. The method of claim 26 where the composition is a negative-acting photoresist comprising a phenol-based resin, an amine-based crosslinking agent, and an acid generator compound.

39. The method of claim 26 where the composition comprises hexamethoxymethyl melamine and hydrolyzed derivatives of hexamethoxymethyl melamine, said hydrolyzed derivatives containing one or more amine groups.

40. A method for forming a relief image comprising:

(a) applying a layer of a radiation sensitive composition to a substrate, the composition comprising a resin binder, an acid generator compound, and a complexing polar compound; and

(b) exposing and developing the composition layer on the substrate to yield a relief image.